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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/451,289	11/30/1999	YOICHI YAMAGISHI	1232-4602	8836

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EXAMINER

HANNETT, JAMES M

ART UNIT	PAPER NUMBER
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2612

2

DATE MAILED: 12/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/451,289

Applicant(s)

YAMAGISHI, YOICHI

Examiner

James M Hannett

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Image sensing apparatus which corrects for dark noise by capturing a dark image data and processing image data based on the dark image data.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1: Claims 1-22 are rejected under 35 U.S.C. 102(e) as being anticipated by USPN 6,061,092

Bakhle et al.

2: As for Claim 1, Bakhle et al teaches an apparatus comprising:

(A) an image sensing device (36); (B) a signal processing device (42) for performing a first image sensing operation for making said image sensing device (36) perform an image sensing operation in an exposure state to obtain a sensed image signal; Column 4, Lines 1-25 This is viewed by the examiner as taking a picture with the camera with the shutter open. Performing a second image sensing operation for making said image sensing device perform an image sensing operation in accordance with said first image sensing operation in a non-exposure state to obtain a sensed image signal; Column 5, Lines 23-26 and Column 1, Lines 41-45. Bakhle et al teaches

Art Unit: 2612

that dark images are captured using the same exposure parameters as the captured image. These dark images are captured by obtaining an image when the shutter is closed. Bakhle et al teaches processing the sensed image signal obtained by the first image sensing operation by the sensed image signal obtained by the second image sensing operation, wherein said signal processing device changes method of the second image sensing operation to the first image sensing operation in response to the instruction of said instruction device; Column 4, Lines 1-25. This is viewed by the examiner as the subtraction process of subtracting the dark image pixel values from the sensed image pixel values. (C) an instruction device for instructing to execute a predetermined plurality times of image sensing operations with different image sensing times of said first image sensing operation; Column 3, Lines 54-57 teaches that the camera captures several dark images that have different exposure parameters. Column 1, Lines 41-43 teaches that the dark images are captured using the same exposure parameters as the scene image. Column 4, Lines 45-48 teaches that a dark image is used until the video camera operating characteristics change enough to require a new dark image. This is viewed by the examiner as a video camera taking a plurality of pictures and subtracting the noise from all the frames in a video stream using one dark image and changing the dark image used when the operating parameters including the exposure time are changed.

3: In Regards to Claim 2, Bakhle et al teaches on Column 1, Lines 41-46 and Column 6, Lines 13-16 wherein said signal processing device (42) selects an image sensing time of the first sensing operation of a predetermined one of the plurality times of image sensing operations in response to the instruction of said instruction device, and makes the second image sensing operation for the plurality times of image sensing operations in accordance with the selected

Art Unit: 2612

image sensing time. Bakhle et al teaches that the camera can capture images with a plurality of exposure settings. Bakhle et al further teaches that the dark images that are subtracted from the acquired image signal are captured using the same exposure conditions.

4: As for Claim 3, Bakhle et al teaches on Column 7, Lines 14-18 A storage device for storing the sensed image signal of the second image sensing operation (Dark image) according to the selected image sensing time.

5: In Regards to Claim 4, Bakhle et al teaches on Column 4, Lines 63-67 and Column 5, Lines 1-22 wherein said signal processing device (42) processes the sensed image signal obtained by the first image sensing operation on the basis of the sensed image signal stored in said storage device in image sensing operations other than the predetermined one of the plurality times of image sensing operations.

6: As for Claim 5, Bakhle et al teaches on Column 1, Lines 41-46 and Column 6, Lines 13-16 wherein said signal processing device (42) selects a longest image sensing time (exposure time) of the first image sensing operation of the plurality times of image sensing operations in response to the instruction of said instruction device, and makes the second image sensing operation for the plurality times of image sensing operations in accordance with the selected image sensing time. Bakhle et al teaches that the camera can capture images with a plurality of exposure settings. Bakhle et al further teaches that the dark images that are subtracted from the acquired image signal are captured using the same exposure conditions. Therefore, it is inherent that the longest exposure time setting will have the same exposure characteristics for both the captured image and captured dark image.

Art Unit: 2612

7: In Regards to Claim 6, Bakhle et al teaches on Column 7, Lines 14-18 A storage device for storing the sensed image signal of the second image sensing operation (dark image) according to the selected image sensing time.

8: As for Claim 7, Bakhle et al teaches on Column 4, Lines 63-67 and Column 5, Lines 1-22 wherein said signal processing device (42) processes the sensed image signal obtained by the first image sensing operation (obtained sensed image) on the basis of the sensed image signal stored in said storage device (dark image) in image sensing operations other than the longest image sensing time of the first image sensing operation of the plurality times of image sensing operations. Bakhle et al teaches that the obtained image signal is subtracted from a dark image that has the same corresponding exposure parameters. Bakhle et al teaches that the dark images are captured in exposures performed after an image is captured or at an initial setup and not during an actual exposure operation to capture an image.

9: In Regards to Claim 8, Bakhle et al teaches on Column 1, Lines 41-46 and Column 6, Lines 13-16 wherein said signal processing device designates an image sensing time of the first image sensing operation of a predetermined image sensing operation in response to the instruction of said instruction device, and makes the second image sensing operation for the plurality times of image sensing operations in accordance with the designated image sensing time. Bakhle et al teaches that the camera can capture images with a plurality of exposure settings. Bakhle et al further teaches that the dark images that are subtracted from the acquired image signal are captured using the same exposure conditions.

Art Unit: 2612

10: As for Claim 9, Bakhle et al teaches on Column 7, Lines 14-18 A storage device for storing the sensed image signal of the second image sensing operation (dark image) according to the selected image sensing time.

11: In Regards to Claim 10, Bakhle et al teaches on Column 4, Lines 63-67 and Column 5, Lines 1-22 wherein said signal processing device (42) processes the sensed image signal obtained by the first image sensing operation on the basis of the sensed image signal stored in said storage device in image sensing operations other than the predetermined one of the plurality of image sensing operations (dark image).

12: As for Claim 11, Bakhle et al teaches on Column 7, Lines 14-18 wherein said apparatus includes a camera.

13: In Regards to Claim 12, Bakhle et al an apparatus comprising:

(A) an image sensing device (36);(B) a signal processing device (42) for performing a first image sensing operation for making said image sensing device (36) perform an image sensing operation in an exposure state to obtain a sensed image signal; Column 4, Lines 1-25 This is viewed by the examiner as taking a picture with the camera with the shutter open. Performing a second image sensing operation for making said image sensing device perform an image sensing operation in accordance with said first image sensing operation in a non-exposure state to obtain a sensed image signal; Column 5, Lines 23-26 and Column 1, Lines 41-45. Bakhle et al teaches that dark images are captured using the same exposure parameters as the captured image. These dark images are captured by obtaining an image when the shutter is closed. Bakhle et al teaches processing the sensed image signal obtained by the first image sensing operation by the sensed image signal obtained by the second image sensing operation, wherein said signal processing

Art Unit: 2612

device inhibiting the second image sensing operation from being made for each image sensing operation in response to the instruction of said instruction device; Column 4, Lines 1-25. This is viewed by the examiner as the subtraction process of subtracting the dark image pixel values from the sensed image pixel values. (C) an instruction device for instructing to execute a predetermined plurality times of image sensing operations with different image sensing times of said first image sensing operation; Column 3, Lines 54-57 teaches that the camera captures several dark images that have different exposure parameters. Column 1, Lines 41-43 teaches that the dark images are captured using the same exposure parameters as the scene image. Column 4, Lines 45-48 teaches that a dark image is used until the video camera operating characteristics change enough to require a new dark image. This is viewed by the examiner as a video camera taking a plurality of pictures and subtracting the noise from all the frames in a video stream using one dark image and changing the dark image used when the operating parameters including the exposure time are changed.

14: As for Claim 13, Bakhle et al teaches on Column 1, Lines 41-46 and Column 6, Lines 13-16 wherein said signal processing device (42) selects an image sensing time of the first sensing operation of a predetermined one of the plurality times of image sensing operations in response to the instruction of said instruction device, and makes the second image sensing operation for the plurality times of image sensing operations in accordance with the selected image sensing time. Bakhle et al teaches that the camera can capture images with a plurality of exposure settings. Bakhle et al further teaches that the dark images that are subtracted from the acquired image signal are captured using the same exposure conditions.

Art Unit: 2612

15: In Regards to Claim 14, Bakhle et al teaches on Column 7, Lines 14-18 A storage device for storing the sensed image signal of the second image sensing operation (Dark image) according to the selected image sensing time.

16: As for Claim 15, Bakhle et al teaches on Column 4, Lines 63-67 and Column 5, Lines 1-22 wherein said signal processing device (42) processes the sensed image signal obtained by the first image sensing operation on the basis of the sensed image signal stored in said storage device in image sensing operations other than the predetermined one of the plurality times of image sensing operations.

17: In Regards to Claim 16, Bakhle et al teaches on Column 1, Lines 41-46 and Column 6, Lines 13-16 wherein said signal processing device (42) selects a longest image sensing time (exposure time) of the first image sensing operation of the plurality times of image sensing operations in response to the instruction of said instruction device, and makes the second image sensing operation for the plurality times of image sensing operations in accordance with the selected image sensing time. Bakhle et al teaches that the camera can capture images with a plurality of exposure settings. Bakhle et al further teaches that the dark images that are subtracted from the acquired image signal are captured using the same exposure conditions. Therefore, it is inherent that the longest exposure time setting will have the same exposure characteristics for both the captured image and captured dark image.

18: As for Claim 17, Bakhle et al teaches on Column 7, Lines 14-18 A storage device for storing the sensed image signal of the second image sensing operation (dark image) according to the selected image sensing time.

Art Unit: 2612

19: In Regards to Claim 18, Bakhle et al teaches on Column 4, Lines 63-67 and Column 5, Lines 1-22 wherein said signal processing device (42) processes the sensed image signal obtained by the first image sensing operation (obtained sensed image) on the basis of the sensed image signal stored in said storage device (dark image) in image sensing operations other than the longest image sensing time of the first image sensing operation of the plurality times of image sensing operations. Bakhle et al teaches that the obtained image signal is subtracted from a dark image that has the same corresponding exposure parameters. Bakhle et al teaches that the dark images are captured in exposures performed after an image is captured or at an initial setup and not during an actual exposure operation to capture an image.

20: As for Claim 19, Bakhle et al teaches on Column 1, Lines 41-46 and Column 6, Lines 13-16 wherein said signal processing device designates an image sensing time of the first image sensing operation of a predetermined image sensing operation in response to the instruction of said instruction device, and makes the second image sensing operation for the plurality times of image sensing operations in accordance with the designated image sensing time. Bakhle et al teaches that the camera can capture images with a plurality of exposure settings. Bakhle et al further teaches that the dark images that are subtracted from the acquired image signal are captured using the same exposure conditions.

21: In Regards to Claim 20, Bakhle et al teaches on Column 7, Lines 14-18 A storage device for storing the sensed image signal of the second image sensing operation (dark image) according to the selected image sensing time.

22: As for Claim 21, Bakhle et al teaches on Column 4, Lines 63-67 and Column 5, Lines 1-22 wherein said signal processing device (42) processes the sensed image signal obtained by the

Art Unit: 2612

first image sensing operation on the basis of the sensed image signal stored in said storage device in image sensing operations other than the predetermined one of the plurality of image sensing operations (dark image).

23: In Regards to Claim 22, Bakhle et al teaches on Column 7, Lines 14-18 wherein said apparatus includes a camera.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPN 6,166,769 Yonemoto et al teaches the use of an image sensor with correlated double sampling; USPN 4,839,735 Kyomasu et al teaches the use of a camera that can vary a charge accumulation time period; USPN 6,483,541 Yonemoto et al teaches the use of a camera that has memory and can cancel the effects of a dark current; USPN 5,719,625 Tani teaches a camera that can eliminate dark current effects; USPN 4,839,729 Ando et al teaches a camera that takes a first exposure and a dark exposure stores the images in memory and performs processing on the image to cancel for dark current effects; USPN 5,194,960 Ota teaches in Figure 6 the use of taking several bracketed images one image with an optimal exposure setting and two other images one with a low exposure setting and one with a high exposure setting; USPN 6,295,415 Kashiyama et al teaches the use of automatic exposure bracketing in which several images with different exposure settings are captured for one image capture operation; USPN 6,177,958 Anderson teaches the use of automatic exposure bracketing; USPN 5,937,218 Amano et al teaches the use of Automatic exposure bracketing in Figure 21.

Art Unit: 2612


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M Hannett whose telephone number is 703-305-7880. The examiner can normally be reached on 8:00 am to 5:00 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to customer service whose telephone number is 703-308-6789.

James M Hannett
Examiner
Art Unit 2612

JMH
December 1, 2003


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